UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/904,458	07/16/2001	Takayuki Murakoshi	010893	8102

23850 7590 03/31/2003

ARMSTRONG,WESTERMAN & HATTORI, LLP
1725 K STREET, NW
SUITE 1000
WASHINGTON, DC 20006

EXAMINER
LUU, THANH X

ART UNIT	PAPER NUMBER
2878	

DATE MAILED: 03/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/904,458	MURAKOSHI ET AL.	
	Examiner	Art Unit	
	Thanh X Luu	2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-9 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-9 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 16 July 2001 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Objections

1. Claims 1-9 are objected to because of the following informalities:

In claim 1, it is unclear what "irradiating light from substantially besides" means. Light is irradiated from beside what?

In claim 2, "the lateral direction" and "the value of the inclined portion" lacks proper antecedent basis. Further, it is unclear what "luminance thereof" refers to.

In claim 3, "the solder printed on a substrate" and "the area" lack proper antecedent basis. Further, "information about area of a top face" is grammatically incorrect. Also, it is unclear how information about a bottom face of the solder is obtained from a camera disposed above the solder.

In claim 4, "the two bright/dark images" and "the image" lack proper antecedent basis.

In claim 5, "the cream solder" lacks proper antecedent basis. Further, it is unclear what "light is irradiated... from substantially beside" means.

In claim 6, "the two bright/dark images" lacks proper antecedent basis.

In claim 7, "the cream solder" in the preamble and "the value of the side inclined portion" lack proper antecedent basis.

In claim 8, "the cream solder" in the preamble and "the respective means" lack proper antecedent basis. Further, it is unclear how dimensions and areas are "counted."

In claim 9, "the cream solder" in the preamble, "the printed circuit board" and "the image" lack proper antecedent basis.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Regarding claims 4, 6 and 9 the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-9, as understood, are rejected under 35 U.S.C. 102(e) as being anticipated by Ludlow et al. (U.S. Patent 6,201,892).

Regarding claims 1, 3 and 5, Ludlow et al. disclose (see Figure 10) an inspection method for cream solder, comprising the steps of: determining (see column 5, lines 50-60) whether or not a shape of the cream solder is appropriate based on information about a height (see Figures 5-7) of the cream solder by irradiating light (from 92, 20)

from beside the cream solder in two directions opposing each other through a lighting means (92, 20) to the cream solder so as to obtain at least two images (see Figure 17; "first image", "second image") and obtaining a difference between the obtained images (see Figure 17; step 470). Ludlow et al. further disclose (see Figure 17) light is irradiated alternately (step 420 and step 450). Ludlow et al. also disclose (see column 10, lines 25-31) obtaining a size or amount of the solder based on the imaging as claimed.

Regarding claims 2 and 7, Ludlow et al. disclose (see Figure 10) an inspection apparatus for cream solder, comprising: a camera (30) disposed above a printed circuit board (14) which is a subject of the inspection; lighting means (92, 20) disposed in a lateral direction of the cream solder (12) applied to the printed circuit board and for irradiating light to the cream solder in two directions opposing each other alternately (see Figure 17); arithmetic operating portion which obtains a difference of luminance between at least two images of a side inclined portion of the cream solder photographed with the camera by alternately turning on the light means (see Figure 17); and determining portion for deciding whether or not the shape of the cream solder is appropriate by comparing the difference of luminance with a preliminary set reference value (see column 12, lines 40-50). The images are dark or bright images.

Regarding claim 8, Ludlow et al. disclose (see Figure 10) an inspection apparatus for cream solder, comprising: a camera (30) disposed above a printed circuit board (14) which is a subject of the inspection; lighting means (92, 20) disposed in a lateral direction of the cream solder applied to the printed circuit board and for

irradiating light to the cream solder in two directions opposing each other alternately; image processing means (see Figure 9) for counting; arithmetic operating means for computing the dimensions and area from the count to obtain the amount of the solder (size); and control means (see Figure 7 and 17) provided with a program for inspecting the shape of the solder to control the apparatus.

Regarding claims 4, 6 and 9, Ludlow et al. disclose (see Figures 10 and 17) an inspection apparatus, comprising: a camera (30) disposed above a printed circuit board (14) which is a subject of the inspection; lighting means (92, 20) disposed a lateral of non-soldered portions of the printed circuit board and for irradiating light to the non-soldered portion in two directions opposing each other alternately (see Figure 17); and arithmetic operating portion which switches the lightning means to obtain a difference between at least two images taken with the camera and removes the non-soldered portion (see Figures 15 and 17).

6. Claims 1, 3 and 5, as understood, are rejected under 35 U.S.C. 102(e) as being anticipated by Ngoi et al. (U.S. Patent 6,525,331).

Regarding claims 1, 3 and 5, Ngoi et al. disclose (see Figure 5) an inspection method for cream solder, comprising the steps of: determining (see column 6, lines 52-59) whether or not a shape (diameter) of the cream solder is appropriate based on information about a height of the cream solder by irradiating light (from L1-L6) from beside the cream solder in two directions opposing each other through a lighting means (L1-L6) to the cream solder so as to obtain at least two images (see Figure 8) and obtaining a difference between the obtained images (see equation 12). Ngoi et al.

further disclose (see Figure 8) light is irradiated alternately. Ngoi et al. also disclose (see column 6, lines 52-59) obtaining an amount of the solder (missing solder or diameter) based on the imaging as claimed.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Bartulovic et al. (U.S. Patent 6,177,682) disclose a similar device.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh X. Luu whose telephone number is (703) 305-0539. The examiner can normally be reached on Monday-Friday from 6:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta, can be reached on (703) 308-4852. The fax phone number for the organization where the application or proceeding is assigned is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Thanh X. Luu
Patent Examiner

txl
March 25, 2003